

CLAIMS

What is claimed is:

- 5 1. A convex shaped die for gripping a tubular comprising:
a back side configured for attachment to a jaw member, wherein said jaw member is attached to a gripping system for gripping tubulars;
a front side for application of a gripping surface to grip said tubular, wherein said front side is adapted to grip the tubular;
10 said front side further comprising at least one metallic overlay surface; and
said at least one metallic overlay surface further comprising a granular particle surface applied over said at least one metallic overlay, wherein said granular particle surface engages said tubular initiating improved gripping.
- 15 2. The die of Claim 1, further comprising a jaw member, wherein said back side of said die is detachably affixed to said jaw member.
3. The die of Claim 2, wherein said jaw member is a part of a gripping tong system.
- 20 4. The die in Claim 1, further comprising a metallic material, wherein said at least one metallic overlay is of a material softer than said metallic material.
5. The granular particle coating of Claim 1, further comprising a tungsten carbide material.
- 25 6. The die in Claim 1, further comprising a non-metallic overlay, wherein said non-metallic overlay engages said tubular initiating improved gripping.
7. A gripping system for gripping tubulars comprising:
at least one tubular to be gripped;
30 a die comprising a metallic material, said die having a front side and a back side wherein

said front side is of a substantially convex shape;

said front side of said substantially convex shaped die further comprises at least one metallic overlay;

5 said front side of said die further comprising a granulated particle surface applied on top of said at least one metallic overlay, wherein said granulated particle surface engages said tubular;

a jaw member wherein said back side of die is detachably affixed to said jaw member, and wherein said jaw member allows said die to engage said tubular;

10 said jaw member being pivotally attached to a rotationally capable drag ring, wherein said rotationally capable drag ring controls a gripping force of said die against said tubular;

a substantially cylindrical apparatus, wherein said cylindrical apparatus is fixedly attached to said rotationally capable drag ring;

a band, having two ends, disposed about said substantially cylindrical apparatus;

15 said band further having an outside surface and an inside surface wherein a friction material is disposed about said inside surface; and

an apparatus for exerting a force on said band wherein said force causes said friction material to slidably engage said substantially cylindrical apparatus to retard a rotation of said rotationally capable drag ring and substantially cylindrical apparatus, whereby said retarding of rotation increases the force of gripping by said die of said tubular .

20

8. The gripping system of Claim 7, wherein said apparatus for exerting a force is a conventional actuated hydraulic cylinder.

9. The gripping system of Claim 7, further comprising an adaptor, having a first end and a 25 second end, wherein said first end is detachably affixed to said back of said die, and wherein said second end is detachably affixed to said jaw member.

10. The die in Claim 7, further comprising a non-metallic overlay, wherein said non-metallic overlay engages said tubular initiating improved gripping.

30

11. A gripping system comprising:

a die member for gripping tubulars, wherein said die is substantially concave shaped;

said die member having a front surface and a back surface;

said front surface is shaped so that the radius of curvature of said concave surface does

5 not match the outside diameter of the tubular being gripped; and

said front surface is substantially free of surface interruptions, wherein said surface comprises at least one metal.

12. The die of Claim 11, wherein said front surface comprises a metal that is softer than said

10 metal surface of the tubular being gripped.

13. The die of Claim 11, wherein said front surface is of substantially the same or greater hardness than the hardness of the tubular being gripped.

15 14. The die of Claim 11, wherein said front surface is of a substantially v-shape.

15. The die in Claim 14, further comprising a non-metallic overlay, wherein said non-metallic overlay engages said tubular initiating improved gripping.

20 16. The die of Claim 11, wherein said concave surface comprises at least one axial cut.

17. The die of Claim 11, wherein said front surface has a radius of curvature substantially smaller than the tubular being gripped.

25 18. The die of Claim 11, wherein said front surface has a radius of curvature substantially larger than the tubular being gripped.

19. The die in Claim 11, further comprising a non-metallic overlay, wherein said non-metallic overlay engages said tubular initiating improved gripping.

30

20. A gripping system comprising:

a die having a front surface and a back surface wherein said front surface is substantially concave;

said front surface is shaped so that the radius of curvature of said concave surface does

5 not match the outside diameter of a tubular being gripped;

said die member comprising a metallic material;

said front surface further comprises at least one metallic overlay; and

said front surface further comprises a granulated particle surface applied on top of said at least one metallic overlay, wherein said gripping system is a power grip tool.

10

21. The die of Claim 20, wherein said front surface has a radius of curvature substantially smaller than the tubular being gripped.

22. The die of Claim 20, wherein said front surface has a radius of curvature substantially

15 larger than the tubular being gripped.

23. The gripping system of Claim 20, wherein said gripping system is a mechanical grip tong.

24. The die in Claim 20, further comprising a non-metallic overlay, wherein said non-metallic

20 overlay engages said tubular initiating improved gripping.

25. A gripping system comprising:

a die having a front surface and a back surface wherein said front surface is substantially concave;

said front surface is shaped so that the radius of curvature of said concave surface does

25 not match the outside diameter of a tubular being gripped;

said die member further comprising a metallic material; and

said front surface is substantially free of surface interruptions, wherein said gripping system is a mechanical grip tong.

30

26. The die of Claim 25, wherein said front surface has a radius of curvature substantially smaller than the tubular being gripped.

27. The die of Claim 25, wherein said front surface has a radius of curvature substantially
5 larger than the tubular being gripped.

28. A gripping system comprising:
a tubular to be gripped by said system;
at least one die;
10 at least one jaw member;
an adaptor, wherein said adaptor extends radially said at least one jaw member, and
wherein said adaptor fits between said at least one die and said at least one jaw member;
a drag ring, wherein said jaws are pivotally attached to said drag ring;
a brake drum fixedly attached to said drag ring; and
15 a band disposed about said brake drum wherein said band exerts a braking friction to said
brake drum when activated.

29. The gripping surface of Claim 28, wherein said die has a substantially concave surface.

20 30. The die in Claim 29, further comprising a non-metallic overlay, wherein said non-metallic
overlay engages said tubular initiating improved gripping.

31. The gripping system of Claim 28, wherein die surface is substantially convex in shape.

25 32. The die in Claim 31, further comprising a non-metallic overlay, wherein said non-metallic
overlay engages said tubular initiating improved gripping.

33. The gripping system of Claim 28, wherein said die is substantially v-shaped, and wherein
said tubular to be gripped is gripped at more than one point of contact.

30

34. The die in Claim 33, further comprising a non-metallic overlay, wherein said non-metallic overlay engages said tubular initiating improved gripping.

35. The gripping system of Claim 28, wherein said concave shape of die has a radius of curvature substantially greater than said tubular to be gripped, and wherein said die has a gripping contact surface at one point.

36. The gripping system of Claim 28, wherein said die has a radius of curvature substantially less than said radius of curvature of tubular to be gripped, and wherein said die surface has at least two points of gripping contact.

37. A method of gripping a tubular comprising the steps of:
providing at least one substantially convex die;
coating said at least one substantially convex die with at least one metal overlay and a granular particle surface;
attaching the die to a jaw member;
pivotally attaching said jaw member to a drag ring;
fixedly attaching a brake drum to said drag ring;
disposing a braking band about said brake drum, wherein said braking band applies a frictional force to said drum when activated;
gripping a tubular with said at least one substantially convex die;
activating said braking band to provide frictional force against drum; and
providing said braking action to generate sufficient predetermined torque to turn tubular.

38. The method of Claim 37, wherein said die has a substantially concave shape, and wherein the radius of curvature of said substantially concave shape does not match an outside diameter of the tubular to be gripped.

39. The method of Claim 38, further comprising the step of coating said die with a non-metallic overlay, wherein said non-metallic overlay engages said tubular initiating improved

gripping.

40. The method of Claim 38, further comprising the step of adding a frictional material to said gripping surface of said concave shaped die.

5

41. The method of Claim 37, wherein said die has a substantially v-shape.

42. The method of Claim 37, further comprising the step of attaching an adaptor, wherein said adaptor extends radially said at least one jaw member, and wherein said adaptor fits between

10 said at least one die and said at least one jaw member.